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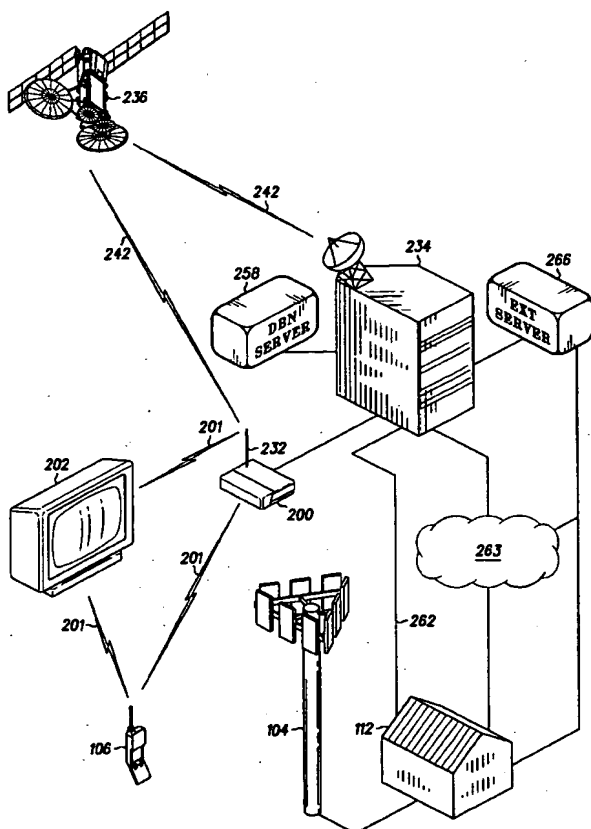
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(54) Title: INFORMATION DELIVERY SYSTEM AND METHOD THEREFOR



(57) Abstract: In the field of digital broadcast services, for example, video-on-demand, a subscriber to the digital broadcast service is required to connect a set-top box to a network terminator point of a fixed land-line. The invention obviates such a requirement by providing a cellular communication apparatus (106) to form a feedback path in an information circuit (201, 262, 263, 242). The subscriber consequently has greater flexibility in terms of portability of subscription and choice of telecommunications service providers.

WO 02/21835 A1

WO 02/21835 A1

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WO 02/21835

PCT/EP01/10396

INFORMATION DELIVERY SYSTEM AND METHOD THEREFOR

Field of the Invention

5 The present invention relates to an information delivery system of the type comprising a source entity capable of transmitting digital information to a service termination unit, for example, a satellite television service network operator transmitting services to a set-top box. The present invention also relates to a method of delivering an information service.

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Background of the Invention

In the field of providing digital broadcast services, for example, video-on-demand, it is known for a subscriber to be provided with a service terminator unit, for example, a "set-top box", for coupling to a television. The set-top box is supplied to the subscriber by a digital broadcast service provider, for example, satellite television companies or cable television companies. The digital broadcast service provider, in conjunction with other organisations, is able to provide more diverse services to the subscriber, for example, on-line banking services or interactive television such as interactive game shows. However, a precondition of some digital broadcast service providers to receiving services forming part of a subscription is that the subscriber must maintain a connection between the set-top box and a network terminator point of a fixed land-line, for example, of a Public Switched Telecommunication Network (PSTN) service provided by a wireline telecommunications service provider. The connection of the set top box to the network terminator point of the PSTN enables a call to be established between the digital broadcast service provider and the set-top box. The precondition is made for a number of reasons, including: providing information of value for marketing purposes to the digital broadcast service provider, updating software in the set-top box, and providing a return communications path between the set-top box and the digital broadcast service provider.

WO 02/21835

PCT/EP01/10396

- 2 -

Summary of the Invention

According to the present invention, there is provided an information delivery system comprising: means for transmitting information originating from a service source to a service terminator unit, the service terminator unit being coupled to at least one output means for presenting at least a portion of information transmitted by the means for transmitting information, wherein the service terminator unit is capable of communicating with a wireless communication apparatus, the wireless communication apparatus being capable of establishing a call with the service source, the call constituting an information feedback path to the service source.

Preferably, the information feedback path to the service source is provided by a communication network, the communication network being capable of communicating with the service source. More preferably, the communication network is a cellular communication network.

Very preferably, the communications network is capable of communicating with the service source via a transit network.

Preferably, any cost associated with the delivery of a service from the service source is billed to a subscriber associated with the wireless communication apparatus.

Preferably, the service terminator unit is capable of communicating with the wireless communication apparatus in accordance with a Bluetooth Standard.

Preferably, the service terminator unit is capable of communicating with the wireless communication apparatus in accordance with an IEEE 802.11b Standard.

WO 02/21835

PCT/EP01/10396

- 3 -

Preferably, service source subscription information and wireless communication apparatus subscription information are required to deliver a service from the service source. More preferably, at least one of the service source subscription information and the wireless communication apparatus subscription information is portable.

More preferably, at least one of the service source subscription information and the wireless communication apparatus subscription information is stored on a respective at least one data carrier.

Most preferably, the respective at least one data carrier is a smart card.

Preferably, the service source is a digital service source.

According to a second aspect of the present invention, there is provided a satellite entertainment broadcast system comprising the information delivery system as set forth hereinabove.

According to a third aspect of the present invention, there is provided a cable entertainment broadcast system comprising the information delivery system as set forth hereinabove.

According to a fourth aspect of the present invention, there is provided a service terminator unit comprising means for receiving information transmitted by a service source, and means for providing at least a portion of the information transmitted by the service source to an output means for presenting at least a portion of the at least a portion of the information transmitted, and means for communicating with a wireless communication apparatus for providing an information feedback path to the service source.

Preferably, the service source is a digital service source.

WO 02/21835

PCT/EP01/10396

- 4 -

According to a fifth aspect of the present invention, there is provided a communication apparatus comprising means for receiving information transmitted by a service terminator unit and means for establishing a call with a service source capable of transmitting information to the service terminator unit, wherein the call constitutes an information feedback path to the service source.

Preferably, the service source is a digital service source.

10 According to a sixth aspect of the present invention, there is provided a use for a wireless communication apparatus, wherein the wireless communication apparatus is capable of establishing a call to a service source of an information delivery system, the call to the service source constituting an information feedback path.

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Preferably, a cost associated with delivery of a service from the service source is billed to a subscription associated with the wireless communication apparatus.

20 Preferably, the service source is a digital service source.

According to a seventh aspect of the present invention, there is provided a method of delivering a service in a system comprising means for transmitting information originating from a service source to a service terminator unit, the service terminator unit being coupled to at least one output means for presenting at least a portion of information transmitted by the means for transmitting information, the method comprising the steps of: providing a wireless communication apparatus for communication with the service terminator unit, and establishing a call to the service source using the wireless communication apparatus.

WO 02/21835

PCT/EP01/10396

- 5 -

Preferably, the method further comprises the steps of: communicating authentication information from the service terminator unit to the service source via the wireless communication apparatus, and delivering the information via the means for transmitting information and the service terminator unit in response to the authentication information.

Preferably, the method further comprises the step of authenticating a subscriber corresponding to the wireless communication apparatus prior to delivering the information.

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Preferably, the method further comprises the step of authenticating the subscriber corresponding to the wireless communication apparatus prior to communicating the authentication information.

15 Preferably, the method further comprises the step of billing a cost of a service from the service source to a subscriber corresponding to the wireless communication apparatus.

20 Preferably, the method further comprises the step of: the service terminator unit communicating with wireless communication apparatus in accordance with a Bluetooth Standard.

25 Preferably, the method further comprises the step of: the service terminator unit communicating with wireless communication apparatus in accordance with an IEEE 802.11b Standard.

30 Preferably, the method further comprises the step of requiring service source subscriber information and wireless communication apparatus subscription information in order to deliver a service from the service source.

WO 02/21835

PCT/EP01/10396

- 6 -

Preferably, at least one of the service source subscription information and the wireless communication information is portable.

5 Preferably, the method further comprises the step of: storing at least one of the service source subscription information and the wireless communication apparatus subscription information on a respective at least one data carrier.

Preferably, the respective at least one data carrier is a smart card.

10 Preferably, the service source is a digital service source.

According to an eight aspect of the present invention, the computer program element comprising computer program code means to make a computer execute the method as claimed in any one of Claims 22 to 33.

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Preferably, the computer program element is embodied on a computer readable medium.

20 It is thus possible to provide a digital information delivery system and method therefor capable of enabling the subscriber to receive digital information services at a location remote from a domicile of the subscriber using service terminating hardware not necessarily owned by the subscriber. Also, the subscriber is not limited to a single telecommunications service provider. Hence, the subscriber is provided with greater choice and flexibility.

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Brief Description of the Drawings

At least one embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

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Figure 1 is a schematic diagram of a communication system, shown in part, for use with an embodiment of the invention;

WO 02/21835

PCT/EP01/10396

- 7 -

Figure 2 is a schematic diagram of a system constituting an embodiment of the invention;

Figure 3 is a schematic diagram of a communication terminal shown in Figure 2;

5 **Figure 4** is a schematic diagram of a service terminator unit shown in Figure 2;

Figure 5 is a schematic diagram of an input/output device shown in Figure 2;

Figures 6 and 7 are schematic diagrams of processor units shown in Figures 3 and 4 respectively;

10 **Figure 8** is a schematic diagram of a server of a digital broadcast network transmitter station shown in Figure 1;

Figures 9, 10 and 11 are schematic diagrams of service management units of Figure 6, 7 and 8, respectively;

Figure 12 and 13 are flow diagrams of operation of the server of Figure 8 in accordance with the embodiment;

15 **Figure 14** is a flow diagram of operation of the processor unit of Figure 7 in accordance with the embodiment, and

Figure 15 is a flow diagram of operation of the processor unit of Figure 6 in accordance with the embodiment.

20 Throughout the following description, identical reference numerals will be used to identify like parts.

25 A cell 100 (Figure 1) in a cellular communication network (not shown) is supported by a base station 102, the base station 102 being coupled to an antenna 104. The base station 102 is capable of communicating with a mobile terminal 106 via a Radio Frequency (RF) communications link 108. The mobile terminal 106 is located, for example, in a domicile 110 of a cellular communication subscriber associated with the mobile terminal 106.

30 Referring to Figure 2, the base station 102 is coupled to a cellular communication network service provider 112 via the cellular communication network. The cellular communication network service provider 112 is coupled to a digital broadcast network transmitter station 234 by a dedicated communication link 262. Optionally, the cellular communication network service

WO 02/21835

PCT/EP01/10396

- 8 -

provider 112 is coupled to the digital broadcast network transmitter station 234 via a transit network 263.

Referring to Figure 3, the mobile terminal 106 comprises a mobile terminal processor unit 300, coupled to a duplexer 302 via a transmitter circuit 304. The mobile terminal processor unit 300 is also coupled to the duplexer 302 via a receiver circuit 306, the duplexer 302 being coupled to a first mobile terminal antenna 308. A mobile terminal volatile memory unit 310, for example, Random Access Memory (RAM) and a mobile terminal non-volatile memory unit 312, for example, Read Only Memory (ROM) are coupled to the mobile terminal processor unit 300. A loudspeaker 314 is coupled to the mobile terminal processor unit 300 via a loudspeaker driver unit 316. Similarly, a mobile terminal input device, for example, a keypad 318, is coupled to the mobile terminal processor unit 300 via a mobile terminal input device driver unit 320. A mobile terminal output device 322, for example, a Liquid Crystal Display (LCD), is coupled to the mobile terminal processor unit 300 via a mobile terminal display driver unit 324. A microphone 326 is also coupled to the mobile terminal processor unit 300 via a microphone driver unit 328. The mobile terminal 106 also comprises a mobile terminal smart card 330 containing subscription information relating to the cellular communication network service provider 112. A second mobile terminal antenna 334 is also coupled to the mobile terminal processor unit 300 via a mobile terminal RF unit 332 so as to enable the mobile terminal 106 to communicate in a Wireless Local Area Network (LAN) 201, enabled by, for example, a Bluetooth Standard, the Institute of Electrical and Electronic Engineers (IEEE) 802.11b Standard, or the Infrared Data Association (IrDA) Standard. It should, however, be appreciated that the functionality of the mobile terminal RF unit 332 can be integrated into the transmitter circuit 304 and the receiver circuit 306, and the second mobile terminal antenna 334 can be integrated into the first mobile terminal antenna 308, if required. The mobile terminal 106 can be any suitable terminal, for example, a cellular telephone handset, such as a Bluetooth enabled Motorola® Timeport™ cellular telephone handset suitably adapted to operate in accordance with this example.

WO 02/21835

PCT/EP01/10396

- 9 -

Although this example has been described in the context of mobility, i.e. the mobile terminal 106, it should be appreciated that the present invention is not limited to terminals that are mobile, and fixed (wireless) terminals can also be used. Additionally, although the cellular communication network (described above) has been used, any known wireless communications network can be employed. Hence, the mobile terminal 106 can be arranged to operate in any suitable communications network, including: a Global System for Mobile communications (GSM) network, a cdmaOne network, an iDEN (Integrated Digitally Enhanced Network), a TERrestrial TRunked Access (TETRA) network, a Personal Digital Cellular (PDC) network, a cdma2000 network or a Wideband-Code Division Multiple Access/Universal Mobile Telecommunication System (W-CDMA/UMTS) network or other similar networks.

A service terminator unit 200 (Figure 2), for example, a "set-top box" for a digital satellite broadcast television system is provided in the domicile 110. Alternatively, the service terminator unit 200 can be for use with any other information delivery system, for example, a hybrid fibre coaxial digital broadcast television system, or a terrestrial television broadcast system.

The service terminator unit 200 is coupled to an input/output (I/O) device 202, for example, a television. Alternatively, the I/O device 202 can be combined with the service terminator unit 200 to form a single unit. It should be recognised and appreciated that instead of the I/O device 202, a device capable of output alone can be employed, for example, a Visual Display Unit (VDU).

Referring to Figure 4, the service terminator unit 200 is provided with a first RF unit 204, the first RF unit 204 being coupled to a first antenna 208 and a service terminator processor unit 212. The first RF unit 204 and the first antenna 208 are used for communicating in the Wireless Local Area Network (LAN) 201. The service terminator processor unit 212 is coupled to: a service terminator volatile storage unit 216, for example, RAM; a service terminator non-volatile storage unit 218, for example, ROM; and a service terminator unit input device, for example, a keypad 220 via a keypad driver 222. A service terminator unit input terminal 224 is coupled to the service terminator processor unit 212 via a

WO 02/21835

PCT/EP01/10396

- 10 -

service terminator input terminal interface unit 226, the service terminator input terminal 224 being coupled to a microwave dish 232 (Figure 2) for receiving signals from the digital broadcast network transmitter station 234 via a satellite 236.

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Although the service terminator unit 200, as described above, is coupled to the microwave dish 232 for receiving signals from the digital broadcast network transmitter station 234 via the satellite 236, it should be understood that other communications techniques can be employed to establish a communication link 242 between the digital broadcast network transmitter station 234 and the service terminator unit 200, for example and not limited to, a line-of-sight microwave link, a fibre-optic cable link, a coaxial cable link or a combination thereof.

15 Optionally, the service terminator unit 200 is provided with a display unit 238, for example, a Light Emitting Diode (LED) display coupled to the service terminator processor unit 212 via a service terminator display driver unit 240. A service terminator unit output port 228 is also coupled to the service terminator processor unit 212 via a service terminator output port driver unit 230.

20

A smart card 233 is insertable into a smart card reader unit 237 via a slot 235. Instead of, or in addition to, the smart card 233 and the smart card reader unit 237, any known data carrier capable of carrying subscription information relating to a digital broadcast network subscriber can be used. The subscription information relating to the digital broadcast network subscriber includes digital broadcast network subscriber identification and authentication information.

25

Referring to Figure 5, the I/O device 202 comprises an I/O device processor unit 214 coupled to an I/O device volatile memory unit 244, for example, RAM and an I/O device non-volatile memory unit 246, for example, ROM. The I/O device processor unit 214 is also coupled to an infra-red receiver 248 for communication with a remote controller unit (not shown), the infra-red receiver 248 being coupled to the I/O device processor unit 214 via an infra-red receiver driver 250. An output unit 252, for example, a Cathode Ray Tube (CRT) is also

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WO 02/21835

PCT/EP01/10396

- 11 -

coupled to the I/O device processor unit 214 via an I/O device display driver unit 254.

- 5 An I/O device input port 256 is coupled to the I/O device processor unit 214, via an I/O device input port interface unit 258, for receiving signals from the service terminator unit output port 228. A second RF unit 206 is coupled to the I/O device processor unit 214 and a second antenna 210 for enabling communications in the wireless LAN 201.
- 10 Although the service terminator unit 200, the I/O device 202 and the mobile terminal 106 are provided with the first, second and mobile terminal RF units 204, 206, 332 respectively, for operation, for example, in accordance with the Bluetooth standard, other wireless communications hardware/software can be employed in order to enable local area communications between the service
- 15 terminator unit 200, the I/O device 202 and the mobile terminal 106 in accordance with any communications standard or technique required, for example the IEEE 802.11b Standard or IrDA Standard.

- 20 Although, in this example, the first RF unit 204 and the first antenna 208 are part of the service terminator unit 200, it should be appreciated that the first RF unit 204 and the first antenna 208 can be packaged separately and coupled to the service terminator unit 200. Similarly, the second RF unit 206 and the second antenna 208 can be packaged separately from the I/O device 202. Additionally, although the service terminator unit 200 is arranged to receive the
- 25 smart card 500, the provision of the smart card 500 is not essential and the functionality of the smart card can be integrated, for example, into the functionality of the service terminator processor unit 212.

- 30 Information flow from the digital broadcast network transmitter station 234 to the service terminator unit 200, between the service terminator unit 200 and the mobile terminal 106, between the mobile terminal 106 and the cellular communication network service provider 112, and between the cellular communication network service provider 112 and the digital broadcast network transmitter station 234 constitutes an information circuit. Information flowing

WO 02/21835

PCT/EP01/10396

- 12 -

from the service terminator unit 200 to the digital broadcast network transmitter station 234 via the mobile terminal 106 and the cellular communication network service provider 112 constitutes an information feedback, or return, path. In order to co-ordinate correct delivery of services to the digital broadcast network subscriber via the service terminator unit 200, the digital broadcast network transmitter station 234 comprises a digital broadcast network server 258 (Figure 1), the digital broadcast network server 258 supporting a Digital Broadcast Network (DBN) service manager unit 800 (Figure 8). Similarly, the mobile terminal processor unit 300 supports a mobile terminal service manager unit 600 (Figure 6) and the service terminator processor unit 212 supports a service terminator service manager unit 700 (Figure 7).

Referring to Figure 9, the mobile terminal service manager unit 600, comprises a mobile terminal session manager unit 900 coupled to a mobile terminal security manager unit 902. The mobile terminal session manager unit 900 is capable of creating, storing, modifying, retrieving and deleting at least one mobile terminal service record 904, the at least one mobile terminal service record 904 corresponding to at least one available service. The mobile terminal session manager unit 900 is also capable of creating, storing, modifying, retrieving and deleting at least one mobile terminal partner identity record 906 comprising an identity of a partner device to the mobile terminal 106 and an associated status of the partner device to the mobile terminal 106.

The service terminator service manager unit 700 (Figure 10) comprises a service terminator session manager unit 908 coupled to a service terminator security manager unit 910. The service terminator session manager unit 908 is capable of creating, storing, modifying, retrieving and deleting at least one service terminator service record 912 corresponding to the at least one available service. The service terminator service manager unit 908 is also capable of creating, storing, modifying, retrieving and deleting at least one service terminator partner identity record 914 comprising an identity of a partner device to the service terminator unit 200 and an associated status of the partner device to the service terminator unit 200.

WO 02/21835

- 13 -

PCT/EP01/10396

- Referring to Figure 11, the DBN service manager unit 800 comprises a DBN session manager unit 916 coupled to a DBN security manager unit 918. The DBN session manager unit 916 is capable of creating, storing, retrieving and deleting at least one DBN service record 920 corresponding to the at least one available service. The DBN session manager unit 916 is also capable of creating, storing, retrieving and deleting at least one DBN partner identity record 922 comprising an identity of a partner device to the digital broadcast network transmitter station 234 and an associated status of the partner device to the digital broadcast network transmitter station 234.
- The mobile terminal session manager unit 900, the service terminator session manager unit 908 and the DBN session manager unit 916 are responsible for identifying and associating the partner devices and the at least one available service in a secure manner, the partner devices being defined as entities forming part of the information circuit. Consequently, the mobile terminal session manager unit 900, the service terminator session manager unit 908 and the DBN session manager unit 916 correlate partner identity records with service records as appropriate, subject to information provided by the mobile terminal security manager unit 902, the service terminator security manager unit 910 and the DBN security manager unit 918, respectively or any human input or another source, for example, a human operator or a custom security server (not shown) coupled to the cellular communication network (not shown) for managing digital broadcast network service privileges.
- The mobile terminal security function manager unit 902, the service terminator security manager unit 910 and the DBN security manager unit 918 are responsible for ensuring that appropriate security algorithms are being, and have been, run. The security manager units 902, 910, 918 are arranged to perform a security co-ordination function. The cellular communication network service provider 112 has proprietary subscriber identification, authentication and user data encryption algorithms. Similarly, the digital broadcast network uses proprietary subscriber identification, authentication and user data encryption algorithms different from those used by the cellular communication network service provider 112. Consequently, there is a need to co-ordinate security

WO 02/21835

PCT/EP01/10396

- 14 -

functions carried out by the digital broadcast network and the cellular communication network service provider 112. The security manager units 902, 910, 918 only have information relating to proprietary security algorithms for devices in which the security manager units 902, 910, 918 are respectively disposed. The security manager units 902, 910, 918 act as gatekeepers for the provision of services, i.e. only devices fulfilling minimum subscriber identification, authentication and user data encryption requirements, i.e. minimum security requirements, are permitted by the security manager units 902, 910, 918 to participate in a given service co-ordinated across the digital broadcast network and the cellular communication network. If the minimum security requirements are not met by one or more of the devices needed to support the given service, the session manager unit, comprising the security manager unit, that has refused to authenticate the device is instructed by the security manager unit to prevent exchange of service related data between the device in question and other devices.

In operation (Figure 12), the DBN session manager unit 916 determines (step 1000) whether a new service is available. If the new service is available, the DBN session manager unit 916 creates (step 1002) a first DBN service record 924 corresponding to the new service comprising at least a new service identifier and a state of the new service. The new service identifier is used to identify the new service and can be used as an index to access specific DBN service records. The state of the new service can include, but is not limited to, active, inactive, starting-up and terminating. The DBN security manager unit 918, responsible for ensuring that appropriate security algorithms are being, and have been, run, then indicates to the DBN session manager unit 916 that a secure information circuit has not been established (step 1004). Consequently, the DBN session manager unit 916 sends a request to the digital broadcast network transmitter station 234 to identify and authenticate (step 1006) the digital broadcast network subscriber.

In response to the request (step 1006) from the DBN session manager unit 916, the digital broadcast network transmitter station 234 transmits (step 1008) an identification and authentication challenge to the service terminator unit 200.

WO 02/21835

PCT/EP01/10396

- 15 -

The identification and authentication challenge is accompanied by the new service identifier created above, an identity of the DBN service manager unit 600 also being broadcast to the service terminator unit 200.

5 In response (Figure 14), the service terminator unit 200, awaiting (step 1010) the identification and authentication challenge, interrogates (step 1012) the smart card 233 inserted into the service terminator unit 200. The interrogation (step 1012) causes the identity of the subscriber and appropriate digital broadcast network subscriber authentication keys and responses to be
10 exchanged between the smart card 233 and the service terminator processor unit 212. The service terminator security manager unit 910 also controls (step 1014) an execution of appropriate service terminator unit proprietary authentication algorithms. The service terminator security manager unit 910 then determines (step 1016) whether the execution of the appropriate service
15 terminator proprietary algorithms has resulted in the digital broadcast network subscriber being successfully authenticated. If the digital broadcast network subscriber is not authenticated, the service terminator security manager unit 910 instructs the service terminator session manager unit 908 to inform the service terminator processor unit 212 that the digital broadcast network
20 subscriber has not been authenticated and to decline (step 1018) the provision of the new service or a set of services.

If the digital broadcast network subscriber is successfully authenticated, the service terminator session manager unit 908 creates (step 1020) a service
25 terminator service record 926 with a service terminator identifier (not shown), the service terminator identifier being the same as, or different from but with a known correspondence to, the new service identifier created by the DBN session manager unit 916. The service terminator session manager unit 908 also creates (step 1020) a first service terminator partner identity record 928
30 containing an identity of the DBN service manager unit 700 and a status of the DBN service manager unit 700. The status of the DBN service manager unit 700 includes, but is not limited to authenticated, unauthenticated, authenticating, available, unavailable, active, idle.

WO 02/21835

PCT/EP01/10396

- 16 -

The service terminator unit 200 then, optionally, awaits (step 1022) a service invocation from a user, for example, the digital broadcast network subscriber. Upon detection of the service invocation, the service terminator unit 200 transmits (step 1024) a service invocation request message via the first RF unit 5 204 and the first antenna 208. The service invocation request message includes the service identifier, the identity of the DBN service manager unit 800, the identity of the service terminator service manager unit 700 and the security status of the service terminator unit 200. Optionally, the security status of the service terminator unit 200 can include an authentication response value 10 received by the service terminator unit 200 from the digital broadcast network transmitter station 234.

Referring to Figure 15, the mobile terminal RF unit 332 and the second mobile terminal antenna 334 of the mobile terminal 106 awaits (step 1026) the service 15 invocation request message. Upon receipt of the service invocation request message, the mobile terminal session manager unit 900 creates (step 1028) a first mobile terminal service record 930 with a mobile terminal identifier. The mobile terminal identifier is the same as, or different from but with a known correspondence to, the new service identifier created by the DBN session 20 manager unit 916. The mobile terminal session manager unit 900 then creates (step 1030) a first mobile terminal partner identity record 932 and a second mobile terminal partner identity record 934, the first mobile terminal partner identity record 932 corresponding to the identity of the DBN service manager unit digital broadcast network service manager unit 800 and the second mobile 25 terminal partner identity record 934 corresponding to the identity of the service terminator service manager unit 700. The mobile terminal 106 then sets up (step 1032) a data call into the cellular communication network service provider 112, the data call addressing the DBN service manager unit 800. Optionally, the address of the DBN service manager unit 800 can be the same as the 30 identity of the DBN service manager unit 800. The mobile terminal 106 then transmits (step 1034), to the DBN service manager unit 800, a service identifier, the identity of the mobile terminal service manager unit 600, the identity of the service terminator service manager unit 700, the security status of the service terminator unit 200 and the security status of the mobile terminal 106. The

WO 02/21835

PCT/EP01/10396

- 17 -

service identifier is the same as or different, but with a known correspondence, to the new service identifier.

Referring to Figure 12, the DBN session manager unit 916 awaiting (step 1036) the service identifier, the identity of the mobile terminal service manager unit 600, the identity of the service terminator service manager unit 700, the security status of the service terminator unit 200 and the security status of the mobile terminal 106, creates (step 1038) a first DBN partner identity record 936 and a second DBN partner identity record 938. The first DBN partner identity record 930 corresponds to the identity of the service terminator service manager unit 700 and contains the security status of the service terminator service manager unit 700. The second DBN partner identity record 938 corresponds to the identity of the mobile terminal service manager unit 600 and contains the security status of the mobile terminal service manager unit 600. Optionally, the DBN security manager unit 918 authenticates the authentication response value, accompanying the security status of the service terminator unit 200, from the service terminator unit 200.

Referring to Figure 13, the DBN service manager unit 800 then instructs the digital broadcast network transmitter station 234 to broadcast (step 1040) the identity and security status of the mobile terminal service manager unit 600 to the service terminator unit 200.

Referring to Figure 14, the service terminator unit 200, awaiting (step 1042) the identity and security status of the mobile terminal service manager unit 600, creates (step 1044) a second service terminator partner identity record 940 upon receipt of the identity and security status of the mobile terminal 106 from the digital broadcast network transmitter station 234. The second service terminator partner identity record 940 contains the identity and the security status of the mobile terminal service manager unit 600. Referring to Figure 13, the DBN service manager unit 800 then broadcasts (step 1046) an information circuit activate command to the service terminator unit 200. The information circuit activate command comprises the new service identifier.

WO 02/21835

PCT/EP01/10396

- 18 -

The service terminator unit 200, awaiting (Figure 14 - step 1048) the information circuit - activate command, - modifies (step 1050) an appropriate service terminator service record, in this example, the first service terminator service record 926 to the "active" state.

5

The DBN service manager unit 800 preferably then transmits (Figure 13 - step 1052) a Service Record Activate command to the mobile terminal 106 via the cellular communication network service provider 112. Alternatively, the Service Record Activate command can be transmitted via the service terminator unit 200 and the wireless LAN 201. The Service Record Activate command comprises the new service identifier. Referring to Figure 15, the mobile terminal 106, awaiting (step 1054) the Service Record Activate command, modifies an appropriate mobile terminal service record, in this example, the first mobile terminal service record 930 to the "active" state.

15

Once the digital broadcast network transmitter station 234 has authenticated the subscriber 200, the cellular communication network service provider 112 has authenticated the mobile terminal 106, and the first mobile terminal service record 930 and the first service terminator service record 926 are both in the active state, the new service can be delivered to the digital broadcast network subscriber via the I/O device 202.

20

Optionally, the mobile terminal service manager unit 600 interrogates (step 1058) the service terminator service manager unit 700 via the mobile terminal RF unit 332 and the second mobile terminal antenna 334 and the second RF unit 206 and the second antenna 210. The interrogation of the service terminator service manager unit 700 ensures that the information circuit is complete. Upon confirmation of a complete information circuit, the mobile terminal service manager unit 600 reports (step 1060) a status of the information circuit to the DBN service manager unit 800.

25
30

If required, any billing for the new service can be carried out in relation to the subscription corresponding to the mobile terminal 106. Alternatively, the billing

WO 02/21835

PCT/EP01/10396

- 19 -

for the new service can be carried out in relation to a subscription of the digital broadcast network subscriber.

5 In another embodiment of the invention, much of the functionality of the terminal 106 in relation to the new service can be implemented as a Mobile Execution Environment (MExE) application downloadable from either the digital broadcast network transmitter station 234, the cellular communication network service provider 112 or the external server 266 depending upon whether the digital broadcast network transmitter station 234, the cellular communication network service provider 112 or the external server 266 is providing the new service.

15 In a further embodiment of the invention, an external server 266 provides another service to the digital broadcast network transmitter station 234. In an example of this embodiment, the information circuit is extended to include the external server 266, authentication of the mobile terminal 106 being carried out with respect to the external server 266 and authentication of the external server 266 being carried out with respect to the digital broadcast network transmitter station 234 in a similar manner to that already described above. Again, proprietary subscriber identification, authentication and user encryption algorithms can be associated with the external server 266. The external server 266 is coupled to the digital broadcast network transmitter station 234 and the cellular communication network service provider 112 directly. Alternatively, the external server 266, the digital broadcast network transmitter station 234, and the cellular communication network service provider 112 are coupled to the transit network 263.

25 Although the examples described above relate to the digital domain, it should be appreciated that the above examples can be implemented in the analog domain.

30

Alternative embodiments of the invention can be implemented as a computer program product for use with a computer system, the computer program product being, for example, a series of computer instructions

WO 02/21835

PCT/EP01/10396

- 20 -

stored on a tangible data recording medium, such as a diskette, CD-ROM, ROM, or fixed disk, or embodied in a computer data signal, the signal being transmitted over a tangible medium or a wireless medium, for example microwave or infrared. The series of computer instructions can constitute

5 all or part of the functionality described above, and can also be stored in any memory device, volatile or non-volatile, such as semiconductor, magnetic, optical or other memory device.

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WO 02/21835

PCT/EP01/10396

- 21 -

CLAIMS:

1. An information delivery system comprising:
means for transmitting information originating from a service source
5 to a service terminator unit, the service terminator unit being coupled to at
least one output means for presenting at least a portion of information
transmitted by the means for transmitting information, wherein the service
terminator unit is capable of communicating with a wireless communication
apparatus, the wireless communication apparatus being capable of
10 establishing a call with the service source, the call constituting an
information feedback path to the service source.
2. A system as claimed in Claim 1, wherein the information feedback
path to the service source is provided by a communication network, the
15 communication network being capable of communicating with the service
source.
3. A system as claimed in Claim 2, wherein the communication network
is a cellular communication network.
20
4. A system as claimed in Claim 2 or 3, wherein the communications
network is capable of communicating with the service source via a transit
network.
- 25 5. A system as claimed in any preceding claim, wherein any cost
associated with the delivery of a service from the service source is billed to
a subscriber associated with the wireless communication apparatus.
6. A system as claimed in any preceding claim, wherein the service
30 terminator unit is capable of communicating with the wireless
communication apparatus in accordance with a Bluetooth Standard.

WO 02/21835

PCT/EP01/10396

- 22 -

7. A system as claimed in one of Claims 1-5, wherein the service terminator unit is capable of communicating with the wireless communication apparatus in accordance with an IEEE 802.11b Standard.
- 5 8. A system as claimed in any preceding claim, wherein service source subscription information and wireless communication apparatus subscription information are required to deliver a service from the service source.
9. A system as claimed in Claim 8, wherein at least one of the service
10 source subscription information and the wireless communication apparatus subscription information is portable.
10. A system as claimed in Claim 8 or 9, wherein at least one of the service source subscription information and the wireless communication
15 apparatus subscription information is stored on a respective at least one data carrier.
11. A system as claimed in Claim 10, wherein the respective at least one data carrier is a smart card.
- 20 12. A system as claimed in any preceding claim, wherein the service source is a digital service source.
13. A satellite entertainment broadcast system comprising the
25 information delivery system as claimed in any one of Claims 1 to 12.
14. A cable entertainment broadcast system comprising the information delivery system as claimed in any one of Claims 1 to 12.
- 30 15. A service terminator unit comprising means for receiving information transmitted by a service source, and means for providing at least a portion of the information transmitted by the service source to an output means for

WO 02/21835

PCT/EP01/10396

- 23 -

presenting at least a portion of the at least a portion of the information transmitted, and means for communicating with a wireless communication apparatus for providing an information feedback path to the service source.

5 16. A service terminator unit as claimed in Claim 15, wherein the service source is a digital service source.

10 17. A communication apparatus comprising means for receiving information transmitted by a service terminator unit and means for establishing a call with a service source capable of transmitting information to the service terminator unit, wherein the call constitutes an information feedback path to the service source.

15 18. A communication apparatus as claimed in Claim 17, wherein the service source is a digital service source.

20 19. A use for a wireless communication apparatus, wherein the wireless communication apparatus is capable of establishing a call to a service source of an information delivery system, the call to the service source constituting an information feedback path.

25 20. A use as claimed in Claim 19, wherein a cost associated with delivery of a service from the service source is billed to a subscription associated with the wireless communication apparatus.

21. A use as claimed in Claim 19, wherein the service source is a digital service source.

30 22. A method of delivering a service in a system comprising means for transmitting information originating from a service source to a service terminator unit, the service terminator unit being coupled to at least one output means for presenting at least a portion of information transmitted by

WO 02/21835

PCT/EP01/10396

- 24 -

the means for transmitting information, the method comprising the steps of:

providing a wireless communication apparatus for communication with the service terminator unit, and

5 establishing a call to the service source using the wireless communication apparatus.

23. A method as claimed in Claim 22, further comprising the steps of:

communicating authentication information from the service
10 terminator unit to the service source via the wireless communication apparatus, and

delivering the information via the means for transmitting information and the service terminator unit in response to the authentication information.

15

24. A method as claimed in Claim 23, further comprising the step of authenticating a subscriber corresponding to the wireless communication apparatus prior to delivering the information.

20 25. A method as claimed in Claim 24, further comprising the step of authenticating the subscriber corresponding to the wireless communication apparatus prior to communicating the authentication information.

26. A method as claimed in Claim 22, further comprising the step of
25 billing a cost of a service from the service source to a subscriber corresponding to the wireless communication apparatus.

27. A method as claimed in Claim 22, further comprising the step of:
the service terminator unit communicating with wireless
30 communication apparatus in accordance with a Bluetooth Standard.

28. A method as claimed in Claim 22, further comprising the step of:

WO 02/21835

PCT/EP01/10396

- 25 -

the service terminator unit communicating with wireless communication apparatus in accordance with an IEEE 802.11b Standard.

29. A method as claimed in Claim 22, further comprising the step of
5 requiring service source subscriber information and wireless communication apparatus subscription information in order to deliver a service from the service source.

30. A method as claimed in Claim 29, wherein at least one of the service
10 source subscription information and the wireless communication information is portable.

31. A method as claimed in Claim 30, further comprising the step of:
storing at least one of the service source subscription information
15 and the wireless communication apparatus subscription information on a respective at least one data carrier.

32. A method as claimed in Claim 31, wherein the respective at least one
data carrier is a smart card.

20 33. A method as claimed in Claim 22, wherein the service source is a digital service source.

34. A program element comprising program code means to make a
25 processor execute the method as claimed in any one of Claims 22 to 33.

35. A program element as claimed in Claim 33, embodied on a computer readable medium.

WO 02/21835

PCT/EP01/10396

1/8

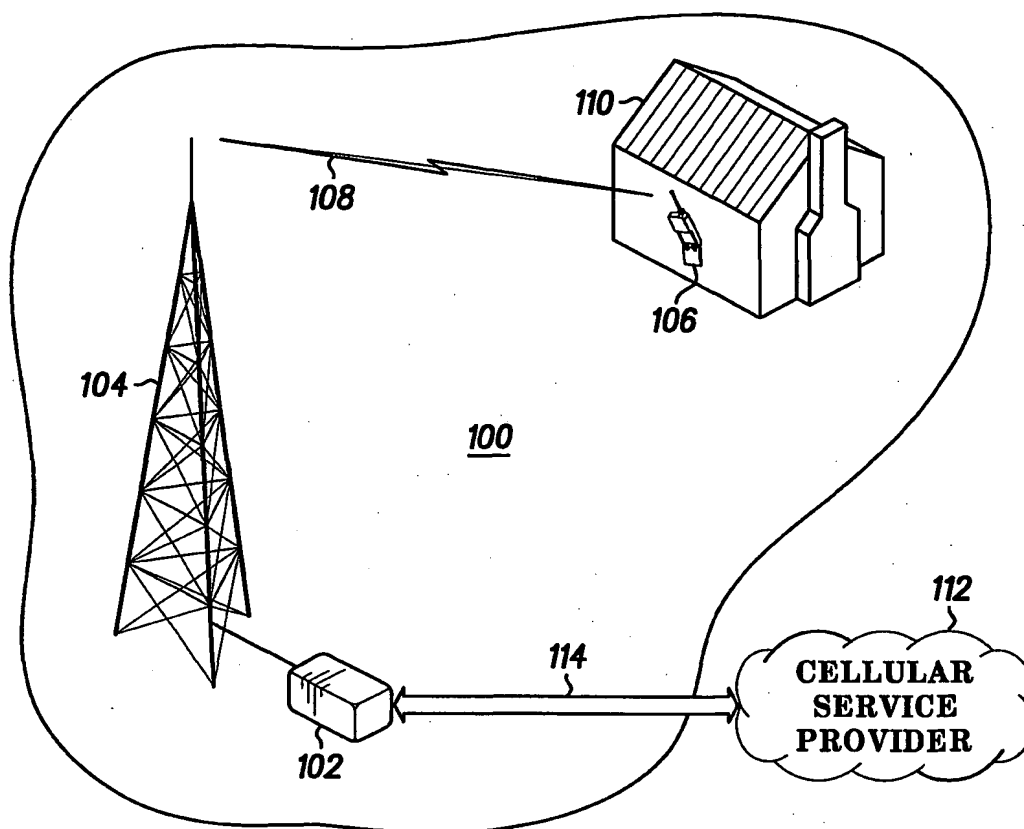


FIG. 1

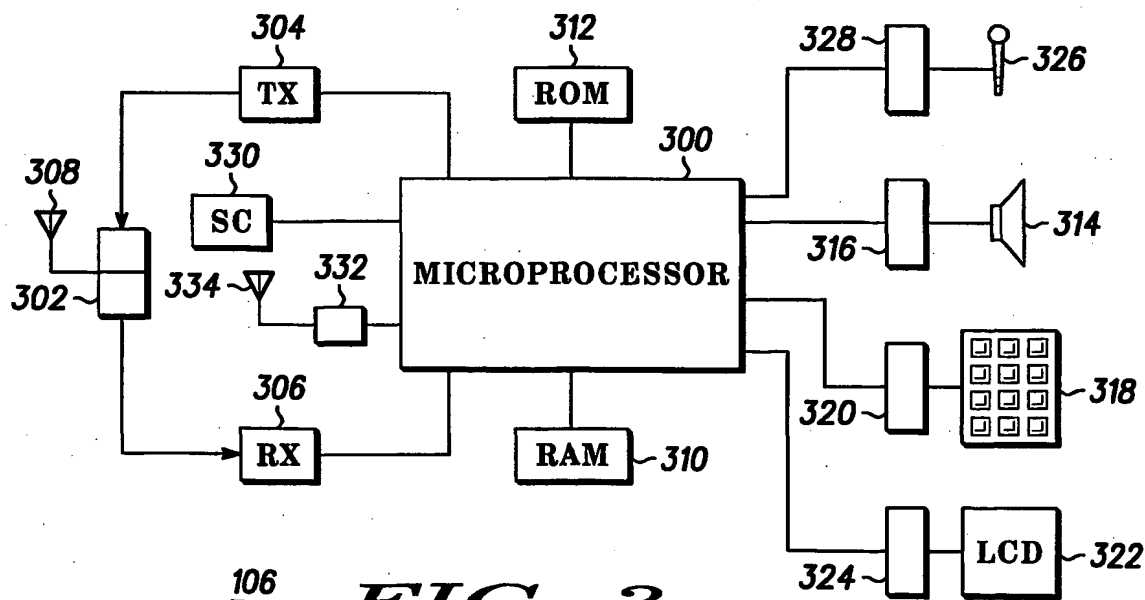
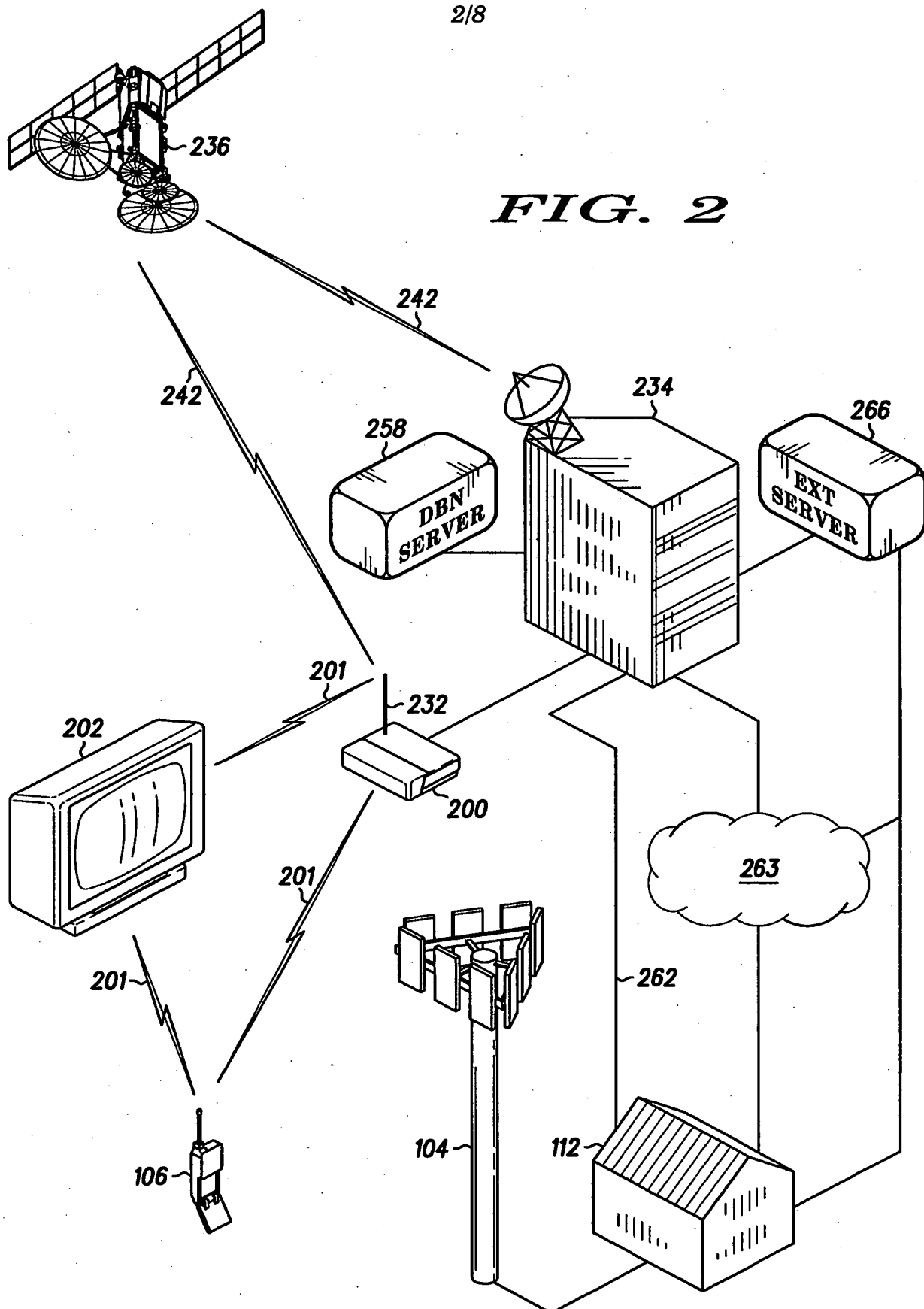


FIG. 3

WO 02/21835

PCT/EP01/10396

2/8



3/8



WO 02/21835

PCT/EP01/10396

4/8

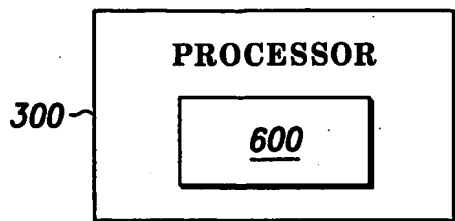


FIG. 6

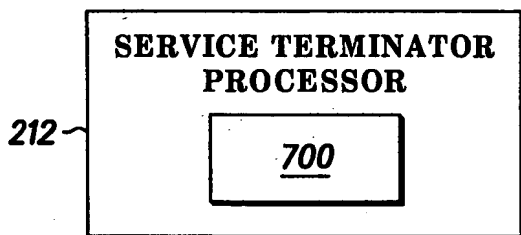


FIG. 7

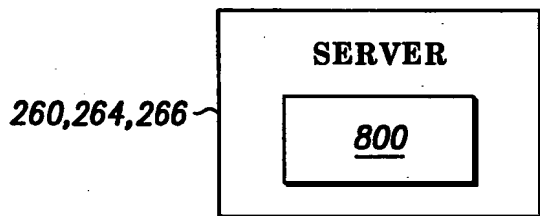


FIG. 8

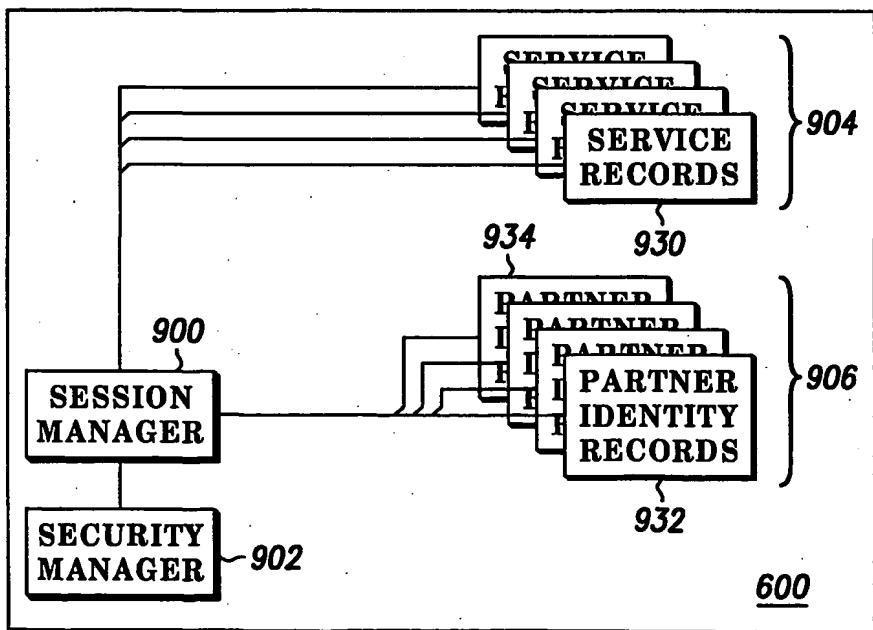


FIG. 9

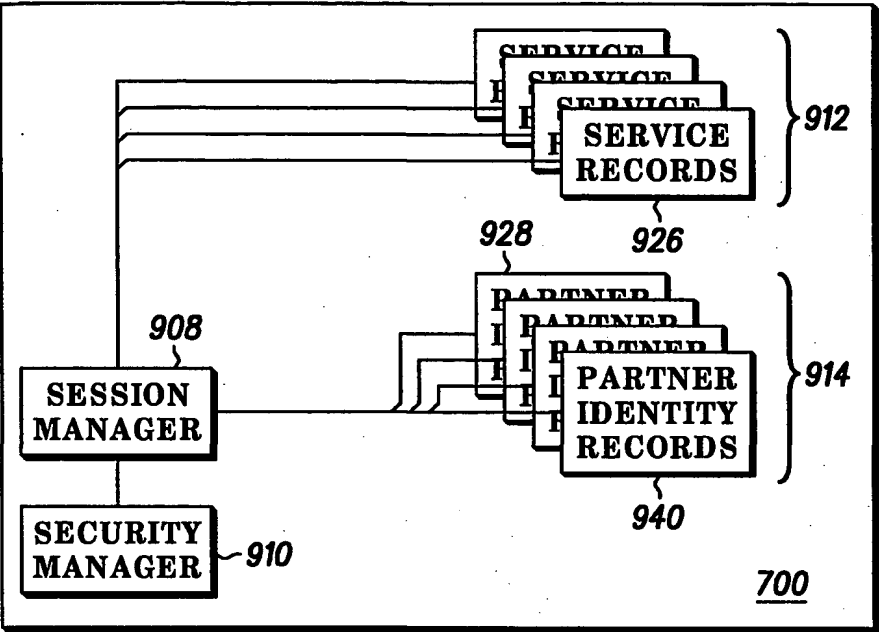


FIG. 10

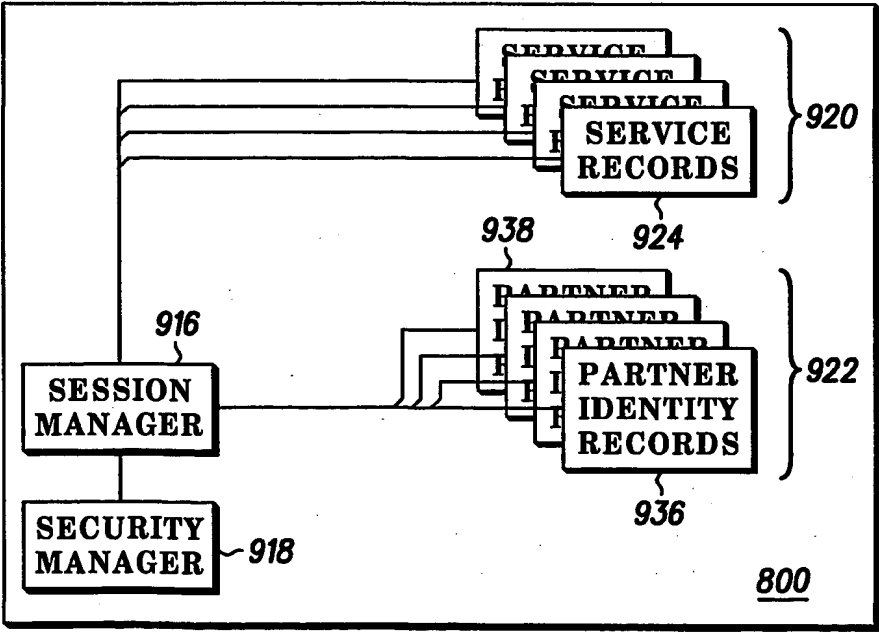
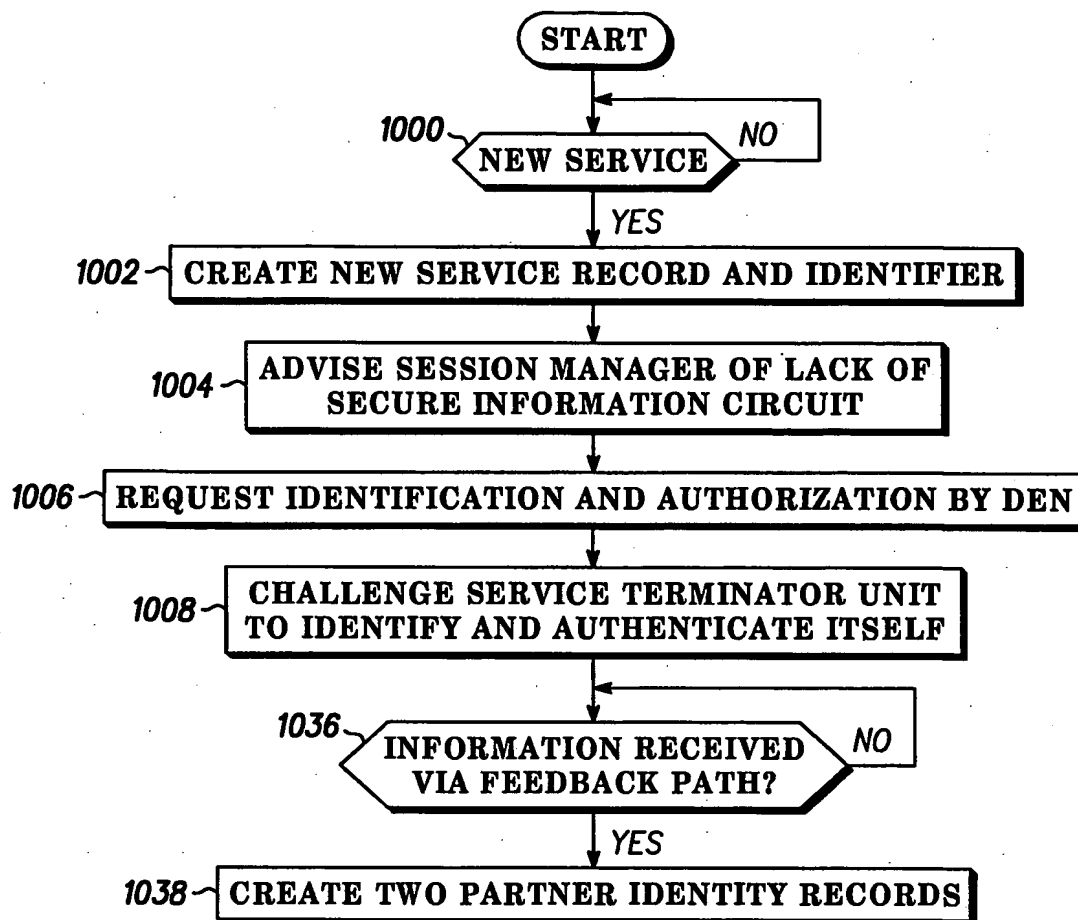
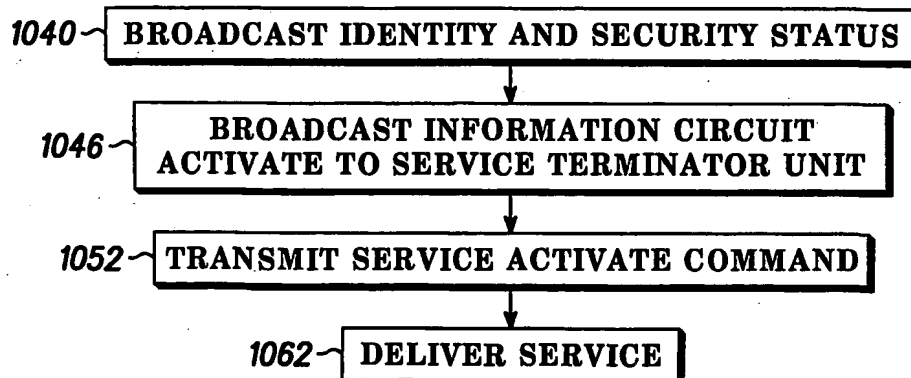


FIG. 11

WO 02/21835

PCT/EP01/10396

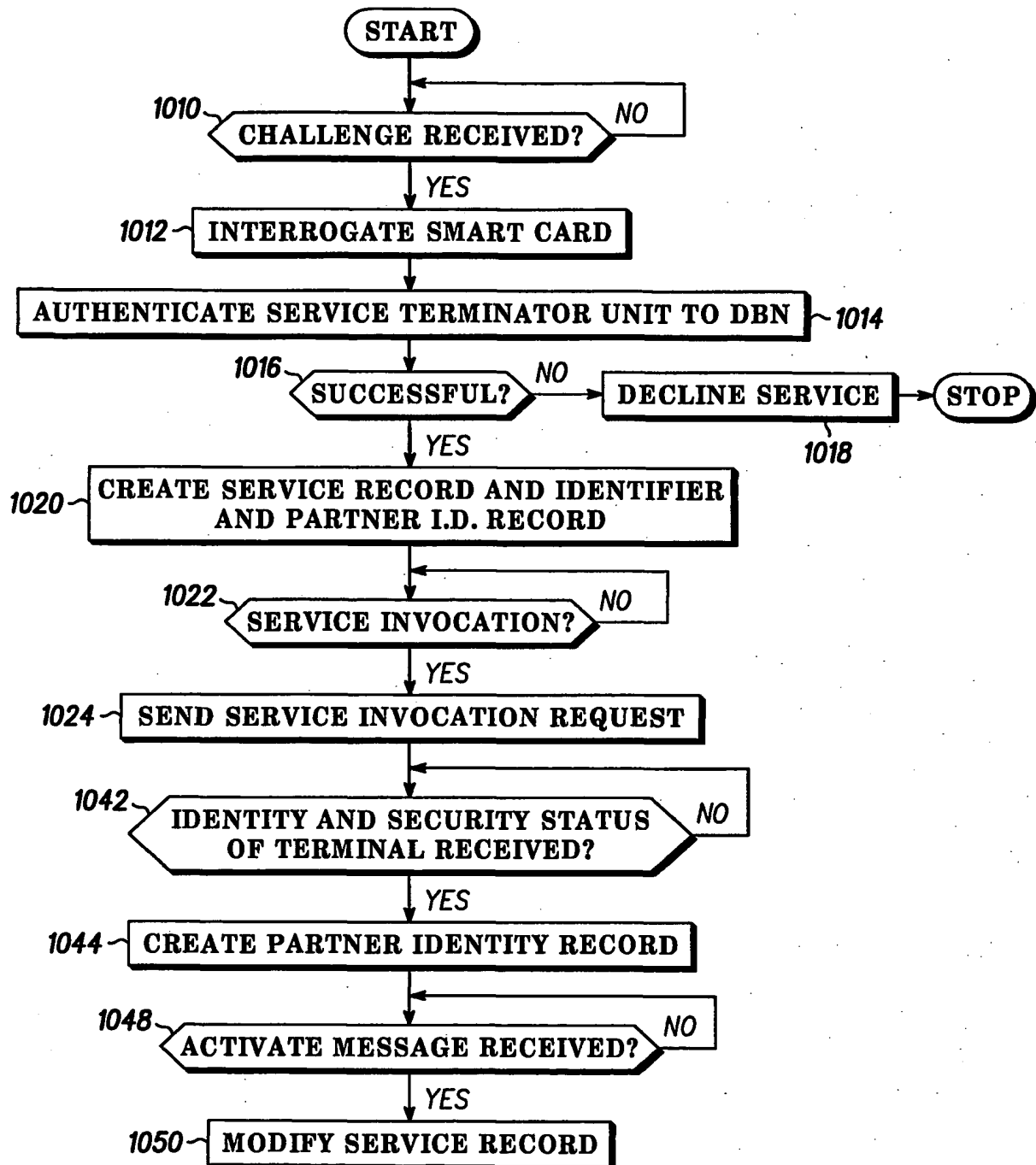
6/8

*FIG. 12**FIG. 13*

WO 02/21835

PCT/EP01/10396

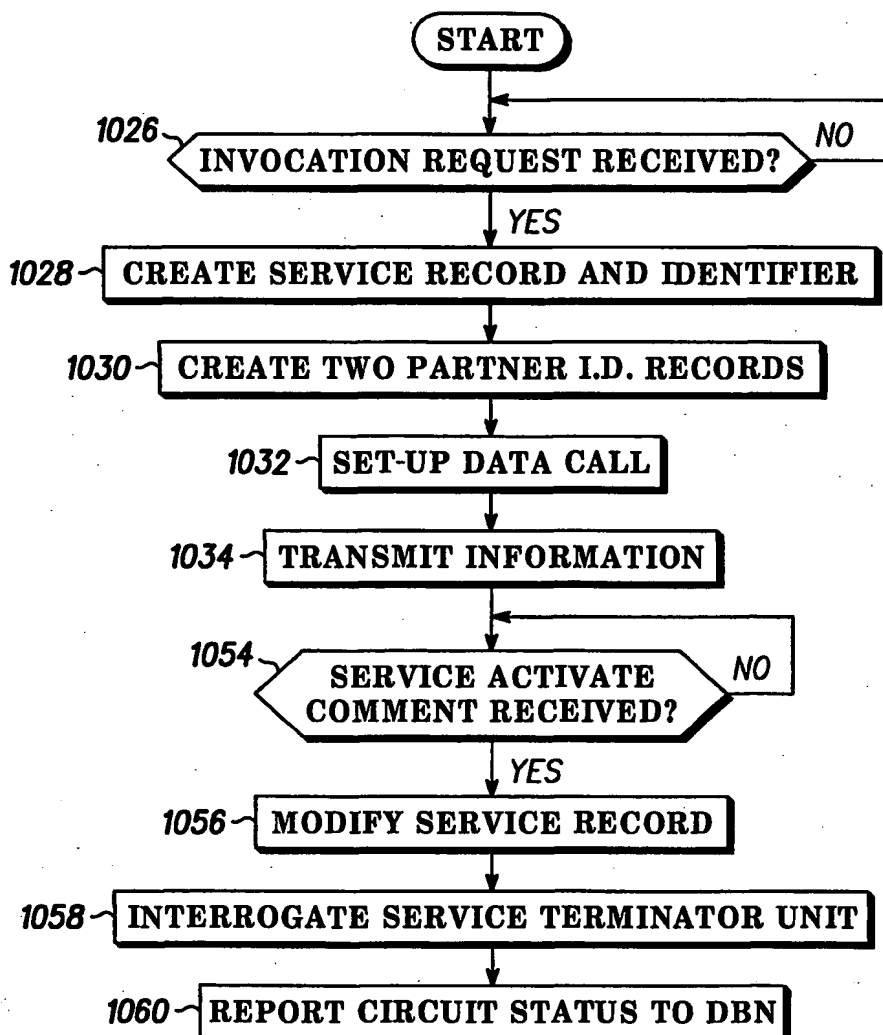
7/8

**FIG. 14**

WO 02/21835

PCT/EP01/10396

8/8

**FIG. 15**

INTERNATIONAL SEARCH REPORT

 International Application No.
 PCT/EP 01/10396

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 H04N7/173

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	paragraph '0008! paragraph '0019! paragraph '0028! paragraph '0039! - paragraph '0044! paragraph '0048! paragraph '0054!	6, 27
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

13 February 2002

Date of mailing of the international search report

28/02/2002

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INTERNATIONAL SEARCH REPORT

PCT Application No
PCT/EP 01/10396

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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